

Appl No.: 10/606,551

Atty. Dkt.: UCF-365

Amendment to the Claims:

This listing of the claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (Currently amended). A method of forming visible light sources with up conversion materials, comprising the steps of:

generating near infrared light from a source;

upconverting the near infrared light through a an encapsulated mixture of upconversion materials located in a sample holder having a reflective surface into a visible light emission dependant on the type of upconversion material used, wherein the near infrared light is upconverted to the visible light emission;

reflecting the visible light emission off the reflective surface; and

applying the reflected visible light emission to a light fixture for at least one of a general lighting source or a decorative lighting source.

Claim 2 (Original). The method of claim 1, wherein the generated near infrared light is emitted from a diode laser.

Claim 3 (Original). The method of claim 2, wherein the diode laser includes an approximately 970 to approximately 980 nm diode laser source.

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Claim 4 (Original). The method of claim 1, wherein the upconversion materials are encapsulated in p-PMMA.

Claim 5 (Original). The method of claim 1, wherein the visible light emission includes: red light.

Claim 6 (Original). The method of claim 1, wherein the visible light emission includes: green light.

Claim 7 (Original). The method of claim 1, wherein the visible light emission includes: blue light.

Claim 8 (Original). The method of claim 1, wherein the visible light emission includes: white light.

Claim 9 (Original). The method of claim 1, wherein the mixture of upconversion materials includes:

yttrium fluoride (YF_3) doped with ytterbium (Yb) and erbium (Er).

Claim 10 (Original). The method of claim 1, wherein the mixture of upconversion materials yields emissions with peaks at approximately 540nm and approximately 660nm.

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Claim 11 (Original). The method of claim 1, wherein the mixture of upconversion materials includes: rare-earth material.

Claim 12 (Original). The method of claim 1, wherein the mixture of upconversion materials includes:

ytterbium-erbium.

Claim 13 (Original). The method of claim 1, wherein the mixture of upconversion materials includes:

ytterbium-thulium.

Claims 14-18 (Canceled).

Claim 19 (Currently amended). A method of forming visible light using upconversion comprising the steps:

providing near-infrared light; and

upconverting the near-infrared light with a rare-earth-doped crystalline host as upconversion particles to produce a visible light; and

reflecting the visible light from a reflector onto a lens, wherein a shape of the lens focuses the reflected visible light in a beam angle; and

applying the reflected visible light to a light fixture as a general lighting source or decorative lighting source, wherein the near infrared light is upconverted to the visible light emission.

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Claim 20 (Previously presented). The method of claim 19, wherein the visible light includes: visible red light.

Claim 21 (Previously presented). The method of claim 19, wherein the visible light includes: visible green light.

Claim 22 (Previously presented). The method of claim 19, wherein the visible light includes: visible blue light.

Claim 23 (Previously presented). The method of claim 19, wherein the visible light includes: visible white light.

Claim 24 (Original). The method of claim 19, wherein the rare earth doped crystalline host includes: NaYF_4 doped with Er and Yb.

Claim 25 (Original). The method of claim 19, wherein the rare earth doped crystalline host includes: YF_3 doped with Er and Yb.

Claim 26 (Original). The method of claim 19, wherein the rare earth doped crystalline host includes: YLiF_4 doped with Tm and Yb.

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Claim 27 (Original). The method of claim 19, wherein the rare earth doped crystalline host includes: YF_3 doped with Tm and Yb.

Claim 28 (Previously presented). An upconversion visible light source for general and decorative lighting, comprising:

means for generating near infrared light from a source;

upconversion materials for upconverting the near infrared light into a visible light emission;

a reflector for reflecting the visible light emission; and

a means for focusing the visible light emission into a light fixture as at least one of a general lighting source or a decorative lighting source.

Claim 29 (Original). The upconversion visible light source of claim 28, wherein the generating means includes: a laser diode.

Claim 30 (Original). The upconversion visible light source of claim 28, wherein the upconversion materials include: rare earth doped crystalline host particles mixed within encapsulation materials.

Claim 31 (Original). The upconversion visible light source of claim 30, wherein the visible light emission includes: visible white light.

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Claim 32 (Original). The upconversion visible light source of claim 30, wherein the visible light emission includes: visible red light.

Claim 33 (Original). The upconversion visible light source of claim 30, wherein the visible light emission includes: visible green light.

Claim 34 (Original). The upconversion visible light source of claim 30, wherein the visible light emission includes: visible blue light.

Claims 35-38 (Canceled).